

PMS30**COST ANALYSIS OF THE USE OF AN OPERATING ROOM WITH FULL-ROTATION 3-D INTRAOPERATIVE IMAGING AND NAVIGATION IN DIFFERENT SPINE SURGERIES**

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OBJECTIVES: The use of navigation and intraoperative imaging permits to perform a large number of procedures more accurately and safely. The aim of this study was to estimate the cost savings achieved by an integrated operating room with full rotation 3-D intraoperative imaging and navigation (NT) compared with a standard operating room in three types of surgery: balloon kyphoplasty, lumbar fusion, and fusion cervical. **METHODS:** We developed a cost analysis through a published literature review of full rotation 3-D intraoperative imaging and navigation studies, taking into account a hospital perspective. We identified the studies with data related to hospital resource savings when compared with a standard operating room (imaging test outside the operating room). Subsequently, potential savings per patient were estimated for each surgery and were updated to euros 2013. Cost data were taken from e-Salud database and Spanish regional tariffs. **RESULTS:** The use of full rotation 3-D intraoperative imaging and NT versus a standard operating room increases surgical process efficiency due to: avoid post surgery computer tomographies to confirm the success of the procedure, increase the accuracy of surgical interventions, avoid complications and reduce the need for re-interventions, reduce the operating room time, faster patient recovery and reduce hospital length of stay. Potential savings by type of surgery were € 615, € 3,242, and € 4,458 for balloon kyphoplasty, posterior cervical fusion, lumbar fusion, respectively. **CONCLUSIONS:** The use of full rotation 3-D intraoperative imaging and NT leads to improved clinical outcomes and increased hospital efficiency in surgeries carried out with it. A 3-D intraoperative imaging system is a cost-saving strategy for balloon kyphoplasty, lumbar fusion, and cervical fusion surgeries from a hospital perspective.

PMS31**HEALTH CARE UTILIZATION AND EXPENDITURES OF OSTEOPOROSIS PATIENTS TREATED WITH ORAL BISPHOSPHONATE IN TIANJIN, CHINA**Yu Q¹, Wu J¹, Ma F¹, Liu J², Jin L³, Lin M⁴, Chang J⁴

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OBJECTIVES: To estimate the health care utilization and expenditures for osteoporosis patients treated with oral bisphosphonate in Tianjin, China and examine factors associated with health care expenditures. **METHODS:** Data were obtained from Tianjin Urban Employee Basic Medical Insurance database (2008–2010) with 30% random sample of enrollees. The index date was the first pharmacy claim date of oral bisphosphonate in 2009. Patients of 40 years of age or older, continuously enrolled for 12 months prior to and following the index date, were included if osteoporosis was diagnosed and oral bisphosphonate (alendronate and etidronate) was claimed accordingly. All-cause cost, osteoporosis-related cost, drug cost, and related health care utilization were estimated at 2009 dollars. Logistic regression analysis was applied to identify factors associated with expenditures. **RESULTS:** Of 853 patients identified, 64.6% were for women. The mean age was 64.6 (±10.4) years. Of \$2039.2 (±2782.6) all-cause cost per person per year, out-of-pocket cost accounted for 2.1%; drug cost accounted for 61.1%; osteoporosis-related cost accounted for 37.9%. Of \$1026.5 (±1108.8) all-cause outpatient cost per person per year, drug cost accounted for 82.3%; osteoporosis-related cost accounted for 14.6%. Of \$1012.7 (±2586.2) all-cause inpatient cost per person per year, drug cost accounted for 39.6%; osteoporosis-related cost accounted for 61.5%. An average of 7.0 (±3.7) outpatient visits and 0.4 (±0.8) hospitalization admissions were found. Regression results demonstrated that patients with diabetes mellitus and nephropathy had higher all-cause cost; female patients and patients with pre-fracture had higher osteoporosis-related cost. **CONCLUSIONS:** The economic burden of osteoporosis is high for osteoporosis patients and is expected to increase considering the increment of life expectancy and the increasing number of elderly population. Greater emphasis and policy guidance should be given to the impact of osteoporosis prevention and treatment in elderly population.

PMS32**THE COST OF OSTEOPOROTIC FRACTURES IN THE ROMANIAN POSTMENOPAUSAL WOMEN POPULATION**Mihalache M¹, Berghes F², Botez I³, Dumitru C⁴, Grigorie D⁵, Ionescu R⁶, Lupescu O⁷, Opris D⁸, Poiana C⁹, Stanciu S⁹, Psachoulia E⁹, Intorcica M⁹

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OBJECTIVES: Little data are available regarding the economic burden of osteoporosis on the Romanian (public payer) health care system. This retrospective chart review estimated the direct costs of osteoporotic fractures in postmenopausal women in Romania. **METHODS:** Women aged >65 years diagnosed with osteoporosis, who sustained an osteoporotic hip, wrist or vertebral fracture between December 1, 2007 and November 1, 2011 (and 1–5 years prior to study enrolment), admitted as inpatients to a sample of Romanian general and specialist hospitals were eligible; patients with multiple fractures or fractures resulting from co-morbidities were excluded. The duration of post-fracture follow-up was one year. The cost perspective included direct costs incurred by the Romanian national health insurance agency and the patients' own budgets. Health care utilization was recorded from hospital and primary care resources, and then multiplied with national tariffs to obtain total costs. Bootstrapping was conducted to generate bias corrected and accelerated confidence intervals. **RESULTS:** Five general hospitals and two specialist hospitals

in three Romanian cities participated. A total of 140 patients were included: 60 (42.8%) with hip, 68 (48.6%) with vertebral and 12 (8.6%) with wrist osteoporotic fractures. The mean [95% CI] total cost of osteoporotic fracture management was €1,155 [€1,044 - €1,304] per patient. Medications (mean [95% CI], €544 [€477 - €624]) and hospital care (€447 [€393 - €512]) were the major cost drivers, accounting for 47.1% and 42.8% of the average total cost respectively. Hip fractures were more costly than vertebral and wrist fractures (mean [95% CI]: €1,384 [€1,186 - €1,643]; €991 [€852 - €1,172]; and €934 [€659 - €1,177], respectively). **CONCLUSIONS:** This study provides the first estimates of the direct cost of osteoporotic fractures in the Romanian health care system. The results suggest that osteoporotic fractures pose a significant burden on both drug and hospital budgets. Effective treatment strategy to avoid such fractures may reduce this burden.

PMS33**MEDICAL COSTS OF PATIENTS WITH RHEUMATOID ARTHRITIS AND ASSOCIATION WITH GLOBAL DISEASE ACTIVITY IN TURKEY**Hamurudan V¹, Direskeneli H², Ertenli I³, Inanc M⁴, Karaaslan Y⁵, Oksel F⁶, Ozbek S⁷, Pay S⁸, Terzioğlu E⁹, Durguner B¹⁰, Baser O¹¹, Akkoç N¹²

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OBJECTIVES: To identify factors associated with the cost of RA care and calculated risk-adjusted costs associated with RA in Turkey. The relationships between costs of RA treatment and disease activity was also examined. **METHODS:** This cross-sectional study was performed in 10 tertiary rheumatology centers. Eligible patients were ≥18 years of age diagnosed as having RA for at least 12 months according to the American College of Rheumatology (ACR) 1987 criteria. Overall costs were categorized as inpatient, outpatient and pharmacy costs. Generalized linear models were used to calculate risk-adjusted direct costs. **RESULTS:** A total of 698 patients were studied. Patients' visual analog scale (VAS), patient's global disease activity (GDA) and routine assessment of patient index data 3 (RAPID-3) scores were on average 44.15, 5.19 and 5.10 respectively. Most patients were prescribed immunosuppressive medications and glucocorticoids (87.8% and 61.2%, respectively). After adjusting all variables, total annual medical cost was €2,671. The most significant portion of overall expenditures was due to pharmaceutical costs €1,987, while outpatient costs were €303, inpatient costs were €360 and co-payments were €21. 14% of patients experienced work loss due to RA. On average, annual costs due to workday loss were €480. 5.4% of patients also had other RA-related consultations, which were not covered by insurance, bringing the average annual burden to €1,600 for these patients. 6.5% of RA patients had additional costs related to their condition such as the need for a new car, apartment or special equipment, spending an additional €1,640 in 1 year. 13.7% of patients required caregivers. The average annual out-of-pocket amount paid to caregivers was €624. **CONCLUSIONS:** The annual medical cost of RA in Turkey, although significantly lower compared to European estimates, causes considerable economic burden. Drug costs constitute the major part of annual cost for RA followed by indirect costs.

PMS34**PATIENTS AS A SOURCE FOR COST OF RHEUMATOID ARTHRITIS STUDY**Marinov L¹, Petrova G²

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OBJECTIVES: To perform the cost of rheumatoid arthritis analysis based on inquiry study with patients. **METHODS:** It is a micro costing study which was conducted between August and December 2012. The information was gathered with the support of the Association of patients with rheumatoid arthritis. The questionnaire was made and distributed to patients waiting in front the physicians' offices. Clarification in case of missing data was made by phone. The questions aimed to gather basic information about the characteristics of the patients, their pharmacotherapy, frequency of physicians' visits, hospitalizations, and their health status self-evaluation. The direct health costs were calculated based on patients' answers and insurance fund tariff. **RESULTS:** A total of 119 patients participated in the study, and nineteen were excluded due to insufficient information. Twenty-two patients were male and 78 were female aged 54.78 years on average. Almost half of the patients (42 patients) were employed. Thirty-four of patients had duration of the RA less than 5 years, 19 had duration between 5–7 years, another 14 patients had duration of between 7–10 years and 33 patients had duration more than 10 years. The total cost for the treatment of the patients for one month was 82 523 BGN (per patient, per month on average 825 BGN). To one quarter of the patients a biological treatment was prescribed with a total cost of 74 026 BGN per year. Ninety-two of the patients answered that they are strictly taking their medicines. Our study shows that most of the patients doesn't knows what medicines they are taking or even doesn't knows their dosing regime. **CONCLUSIONS:** The percentage of the patients that are not following the doctor's prescription is very high and their reliability as a source of cost studies is not sufficient that impose the need of patient education.

PMS35**WORK PRODUCTIVITY LOSS DUE TO RHEUMATOID ARTHRITIS IN POLAND. RESULTS OF CROSS-SECTIONAL STUDY OF OUTPATIENTS WITH CHRONIC INFLAMMATORY DISEASES AND COMPARISON WITH SELECTED STUDIES**

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OBJECTIVES: To measure productivity loss of RA patients in Poland compared to results of selected studies. **METHODS:** In this study consecutive patients in

productive age (18–60 for women and 18–65 for men) were recruited at regionally stratified sample of rheumatology outpatient centers around the country and were offered a questionnaire including Work Productivity and Activity Impairment (WPAI) instrument (a standardized tool for loss of work productivity estimation). The survey was complemented by disease activity assessment questionnaire filled out by specialists who were also responsible for patients recruitment during the routine visits. Employed patients were estimating i.a. the absenteeism and presenteeism rates (% of work time missed due to health and % of impairment while working). Subsequently, systematic review of Medline database was conducted. Two studies using WPAI questionnaire were found (Bansbrack 2012, Zhang 2010). **RESULTS:** In the study, mean age of RA patients was 49 (mean age at RA onset was about 39), mean DAS28 result 3.77 (moderate disease). 40% of the group had first symptoms for less than 5 years (mean duration since symptoms onset was 90 months). Meanwhile, in Bansbrack 2012 mean age at RA onset was 48 and mean duration since onset of symptoms was 48.6 months. Mean age of patients described in Zhang 2010 was 51, 45.8% had disease duration of less than 5 years. The participants had a low function disability level and moderate arthritis. In the study absenteeism rate was 18%, while presenteeism rate reached 27%. The corresponding values in Bansbrack 2012 were 8.7% and 24%. In Zhang 2010 only presenteeism rate was analyzed and equaled 17.8%. **CONCLUSIONS:** RA reduces work ability and lower work productivity in people in productive age both in Poland and in other countries. Differences in patients characteristics are probably the cause of results variation between studies.

PMS36

HEALTH CARE RESOURCE USAGE, TREATMENT AND COSTS AMONG PATIENTS WITH HIP FRACTURE IN THE UNITED KINGDOM

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OBJECTIVES: Available data on economic impact of hip fractures in the U.K. are mostly derived from clinical trials or published before the year 2000; recent estimates are lacking. This study examined health care resource usage, treatment and costs among patients with hip fracture in the U.K. **METHODS:** The study used data from the Clinical Practice Research Datalink (CPRD) linked to the Hospital Episode Statistics (HES). Adult patients hospitalised for hip fracture (ICD-10: S72 or M84.4; admission date as index date between January 1, 2006–March 31, 2011) and no previous hip fracture 7 days to 1 year pre-index, and computerised data available 1 year pre and 1 year post-index were identified in HES. Hip fracture-related inpatient and outpatient visits and pharmaceutical treatments were estimated for pre- and post-index periods. Associated costs were calculated by multiplying resource units by official publicly available costs from the NHS perspective. **RESULTS:** A total of 8,028 hip fracture patients were identified (mean age 79; 27% age 85+; 75.8% female; mean Charlson comorbidity index score 2.1). The most common comorbidities were osteoarthritis (42%), pulmonary disease (25%), and renal disease (23%). Pre-index, average resource use per patient included 1 inpatient stay (mean 5.7 days), 7.4 General surgery visits, 4.4 blood tests, and 0.76 General Practice phone consults. Average overall costs pre-index were £3122. For the index hospitalisation, mean length-of-stay and costs were 19.5 days and £14223, respectively; 18% were discharged to another hospital; and 39% and 5% had partial or total hip arthroplasty procedures performed. Post-index frequent medications included acetaminophen (56%), opioids (46%), and bisphosphonates (46%); 51% had hospital stays; and 5.7% had subsequent hip fractures. Average post-index overall costs were £7359. **CONCLUSIONS:** Our study provides recent estimates of resource usage, treatment and costs among U.K. hip fracture patients. This information can be useful in burden of illness and economic analyses.

PMS37

RESOURCE UTILISATION AND COSTS OF TOTAL HIP ARTHROPLASTY IN THE UNITED KINGDOM: A DESCRIPTIVE ANALYSIS

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OBJECTIVES: Total hip arthroplasty (THA) is a commonly performed surgical procedure in the elderly, projected to increase substantially due to the aging population. Newer resource use and cost estimates are needed to understand the potential THA burden. The study objective was to estimate health care resource use and costs in THA patients in the U.K. **METHODS:** The Clinical Practice Research Datalink (CPRD) linked to the Hospital Episode Statistics (HES) was used to estimate resource use in THA patients. Inclusion criteria were: first inpatient stay for THA (OPCS procedure code W37–W39, W46–W48, W93–W95) (index event between 1/1/2006–3/31/2011); no THA diagnosis/procedure 7 days to one year pre-index date; 1-year pre and 1-year post-index of computerised data available; age 18+. Inpatient, outpatient and pharmacy THA-related costs were calculated by multiplying resource units by official publicly available costs (British Pound Sterling, 2012) from the NHS perspective. **RESULTS:** THA patients identified (n=15,288) were mostly female (66%), elderly (mean age 72; 45%>75), and 84% had osteoarthritis. Pre-index, the most common medications were opioids (53%), NSAIDs (41%), and acetaminophen (35%); 95% had General surgery visits; 64% had inpatient stays; 36% had x-ray; and overall costs (std. dev) were £4,556 (7850). The index hospital event average length-of-stay (LOS) was 9 days and mean costs were £11,321. Post-index medication usage for opioids, NSAIDs, and acetaminophen was 49%, 29%, and 45%, respectively. The most frequent resources were General surgery visits (94%), hospital stays (39%), and General Practice phone consults (35%). For patients with utilisation, means per patient were 7.4 for General surgery visits, 5.4 days for hospitalisations. Mean (std. dev) overall post-index costs were £3,567 (9612), comprised mostly of inpatient costs (85%). **CONCLUSIONS:** This study described resource utilisation, pain medications usage and associated costs for THA patients. These estimates may offer a better understanding of the economic burden.

PMS38

OUTPATIENT MEDICAL COSTS, INDIRECT COSTS, AND FAMILY BURDEN OF OSTEOPOROSIS FRACTURE IN CHINA

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OBJECTIVES: The prevalence of osteoporosis fractures is anticipated to increase rapidly due to China's aging population. However, representative data on the economic burden of osteoporosis fractures are lacking. The aims of this study were to estimate direct outpatient medical costs, indirect costs and family burden associated with patients with osteoporosis fractures in China. **METHODS:** One hundred and fifty osteoporosis fracture patients and/or care-givers were interviewed within 149 days [median] post-fracture in three tertiary hospitals in Beijing, Wuhan and Chongqing representing eastern, middle and western China. Fracture patients were discharged from hospital between January 2011 and January 2013. The survey collected data on demographics; ambulatory status; outpatient services and costs (emergency room, drugs, other outpatient); indirect medical services and supplies and costs (nursing, transportation, rehabilitation, devices, etc.); and lost work time from caregivers. **RESULTS:** Of the 123 valid respondents (female: 64.2%; mean age: 71.3 years), 62.6% were hip fractures, followed by vertebral fracture (34.1%), non-vertebral/non-hip fracture (2.4%), and multiple fracture (0.8%). All patients received surgical treatment, 8.9% had historical fractures, 80.5% had comorbidities and 82.9% of patients had post-discharge outpatient visits. The most frequent comorbidities were hypertension (61.0%), rheumatoid arthritis (41.5%), high cholesterol (35.0%) and cardiovascular disease (34.2%). Reported disability (walk w/aid or could not walk) increased from 13% pre-fracture to 36% post-fracture. Average post-acute outpatient care costs and indirect medical costs were 2084 RMB and 3526 RMB, respectively. Care-givers reported an average of 33.2 days lost from work. Using median income from the three regions, the estimated average lost income for caregivers was 5910 RMB (weighted by share of responders per region). **CONCLUSIONS:** The study suggests the economic burden of osteoporosis fractures is considerable in terms of outpatient medical costs, indirect medical costs and family burden. Osteoporosis-related fractures may pose a significant burden to China due to the aging population.

PMS39

ANNUAL EXPENDITURE ON ANTI-TNF TREATMENT OF RHEUMATOID ARTHRITIS FOR THE PUBLIC HEALTH SYSTEM IN BRAZIL

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OBJECTIVES: Provide clinically relevant evidence and drug expenditure information for Brazilian public health system management. **METHODS:** We performed a systematic review on the use of anti-TNF biological agents, infliximab, adalimumab and etanercept in the treatment of patients with rheumatoid arthritis, using the precepts of evidence-based medicine, ensuring methodological quality of clinical studies, prioritizing clinical outcomes. Clinical evidence was retrieved in PubMed, Central Cochrane, EMBASE and medicine purchase costs in July 2010. **RESULTS:** Twenty-three randomized trials met the eligibility criteria, six on infliximab, nine on adalimumab and eight on etanercept. Adalimumab and etanercept showed no benefits when not associated with methotrexate. The ACR50 response to infliximab (NNT = 6) and adalimumab (NNT = 5) were similar while the results for etanercept were considered heterogeneous. The annual cost of infliximab to treat six patients and get ACR50 response in a single patient was US\$ 125,997.00 while for adalimumab to treat five was US\$ 186,990.00. The ACR70 response was similar between etanercept (NNT = 9) and adalimumab (NNT = 10), being lower in the recommended dose of infliximab (NNT = 12). The most favorable annual cost of acquisition was observed with adalimumab which US\$ 311,651.00 is needed to treat 10 patients and get ACR70 response in a single one, compared to expense of US\$ 365,107.00 with etanercept (NNT = 9). The unusual infliximab dose of 10mg/kg showed similar results (NNT = 9), however with the most unfavorable spent of US\$ 680,385.00. **CONCLUSIONS:** Adalimumab was the agent who showed the most favorable annual expenditure for medicine purchase from the perspective of the public health system in Brazil, considering the most clinically relevant response.

PMS40

BIOLOGICAL TREATMENT PATTERNS AND ASSOCIATED COSTS FOR PATIENTS WITH RHEUMATOID ARTHRITIS IN TAIWAN

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OBJECTIVES: To examine the pattern of biological treatment and the medical costs for patients with rheumatoid arthritis (RA). **METHODS:** A longitudinal dataset that includes the claims of service used by a cohort of RA patients from the Bureau of National Health Insurance was used for this study. The inclusion criteria for the study cases were patients who: 1) were holding the Catastrophic Illness Card with RA; 2) had the 1st line TNF- α antagonist treatments for at least 6 months; 3) were aged over 17. Treatment patterns were defined based on their TNF- α Antagonist within 12 months after the initial 6-month treatment period. Wilcoxon signed rank tests were performed to compare differences in service costs and service uses between the pre- and post-biological treatment periods. **RESULTS:** In total, 2425 patients were eligible for analysis. In the first year after TNF- α initial 6-month treatment, 94% remained using the same TNF- α antagonist, 3% had switched from one to another TNF- α antagonist, and 3% discontinued use of TNF- α antagonist. RA patients treated with TNF- α antagonist were significantly associated with reductions in emergency room visits ($p < 0.001$), hospital days ($p < 0.01$) and total medication costs (excluding biologics) ($p < 0.01$). However, total RA-related outpatient visits and overall medication costs went up significantly ($p < 0.001$). Reduction in services use was not